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EXAMINER	
DOTE, JANIS L	

ART UNIT	PAPER NUMBER
1756	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/734,380	MISHRA ET AL.	
	Examiner	Art Unit	
	Janis L. Dote	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/12/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. This office action is responsive to the amendment filed on Apr. 22, 2004. Claims 1-21 are pending.

2. The oath or declaration filed on Apr. 22, 2004, is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

Non-initialed and/or non-dated alterations have been made to the oath or declaration. See 37 CFR 1.52(c).

The alterations to the names of the inventors Robert C. Yu and Yuhua Tong were not initialed or dated.

3. The examiner notes that the declaration filed on Apr. 22, 2004, identifies the instant application as entitled as "Imaging member having a dual charge transport layer." However, the USPTO has entitled the instant application as "Imaging members." The title "Imaging members" was obtained from page 1 of the instant application. Applicants should submit an amendment to change the title of the instant application as mentioned in the declaration.

4. Applicants have not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) as follows:

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application); the disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The provisional application 60/433,886 (Application'886), filed on Dec. 16, 2002, does not provide an adequate written description of the subject matter recited in the instant claims. For example, Application'866 does not disclose the Formula (III) recited in instant independent claims 1 and 21 and dependent claim 19. See Application'866, pages 5 and 29. The compound disclosed in Application'866 shows that the group -CH=CH- is substituted at the meta (i.e., 3) position of the phenyl group bonded to the nitrogen atom in the triphenylamine moiety. However, in Formula (II) recited in instant claims 1, 19, and 21, the group -CH=CH- substituent is not limited to meta position of the phenyl group bonded to the nitrogen atom in the triphenylamine moiety. In addition, Application'866 does not define the R1 to R6 groups in the compound disclosed at pages 5 and 29 of Application'866. Nor does Application'866 disclose

that the compound comprises the central 1,4-divinylphenyl group shown in Formula (II) of instant claims 1, 19, and 21. With respect to instant independent claim 10, Application'866 does not disclose that the charge transport compounds of the first charge transport layer comprise "diamines" as broadly recited in claim 10. Rather, Application'866 discloses that the charge transport compounds in the first charge transport layer can comprise particular aryl amines and particular diamines disclosed at page 4, line 22, to page 5, line 1, page 5, lines 13-16, and page 15, lines 17-18. For example, "a diamine, represented by" the formula disclosed at page 5, line 1. The term "diamines" is broader than the compounds disclosed in Application'866 because they include compounds that are not disclosed in Application'866, such as N,N'-diphenyl-N,N'bis(p-methoxyphenyl)-[1,1'-biphenyl]-4,4'-diamine.

Accordingly, the subject matter recited in instant claims 1-21 is accorded the filing date of Dec. 12, 2003.

5. The disclosure is objected to because of the following informalities:

(1) There are spelling errors throughout the specification. For example, the misspellings "hydroxylpropylallulose" at page 12, lines 29-30, and "stylbene" at page 31, line 18. These

examples are not exhaustive. Applicants should review the entire specification to correct the spelling errors.

(2) The use of trademarks, e.g., Vitel [sic: VITEL] at page 25, line 9, has been noted in this application. The trademarks should be capitalized wherever they appear and be accompanied by the generic terminology. This example is not exhaustive. Applicants should review the entire specification for compliance.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Appropriate correction is required.

6. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

(1) In claims 1 and 21, the recitation "film forming polymer binder [of both charge transport layers] is selected from the group consisting of . . . polyesters, polyvinyl butyrals, polystyrene-b-polyvinyl pyridine, poly(vinyl butyral), poly(vinyl chloride), polyacrylates, polymethacrylates, copolymers of vinyl

chloride and vinyl acetate, phenoxy resins, polyurethanes, poly(vinyl alcohol) and polyacrylonitrile" lacks antecedent basis in the specification. See page 19, lines 1-5, of the specification, which discloses that the film forming polymer binder can be a polycarbonate, poly(vinyl carbazole) and polystyrene.

(2) In claim 13, the amount range "about 25 to about 40 weight percent" lacks antecedent basis in the specification. See page 8, lines 2-4, and page 9, lines 7-11, of the specification, which discloses that the amounts of "between about 20 and about 45 weight percent" and "between about 30 and 40 weight percent."

(3) In claim 20, the recitation "binder is selected from the group consisting of polyesters, polyvinyl butyrals . . . and polyvinyl formats" lacks antecedent basis in the specification. See page 19, lines 1-5, of the specification, which discloses that the film forming polymer binder can be a polycarbonate, poly(vinyl carbazole) and polystyrene.

7. Claims 1, 17, 18, and 21 are objected to because of the following informalities:

In claims 1 and 21, the misspelling "ethy" in the term "bis(4-ethyamine-2-methylphenyll)phenylmethane" (emphasis added).

In claims 1 and 21, misspelling "stylbene."

In claims 1 and 21, the term "N,N'-diphenyl-N,N'-bis(alkylphenyl)-1,1-biphenyl-4,4'-diamine" (emphasis added) should be rewritten as "N,N'-diphenyl-N,N'-bis(alkylphenyl)-1,1'-biphenyl-4,4'-diamine" (emphasis added).

In claims 1 and 21, the term "N,N'-diphenyl-N,N'-bis(chlorophenyl)-1,1-biphenyl-4,4'-diamine" (emphasis added) should be rewritten as "N,N'-diphenyl-N,N'-bis(chlorophenyl)-1,1'-biphenyl-4,4'-diamine" (emphasis added).

In claim 17, a comma is missing between the terms "enamine" and "phenanthrene diamine."

In claim 18, the term "N,N^1-diphenyl-N,N^1-bis(3-methylphenyl)-1,1^1-biphenyl-4,4^1-diamine" (emphasis added) should be rewritten as "N,N'-diphenyl-N,N'-bis(3-methyphenyl)-1,1'-biphenyl-4,4'-diamine" (emphasis added).

Appropriate correction is required.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point

out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 21 are indefinite in the term "hydrozole" because it is not clear what is meant by the term "hydrozole," which is not defined in the instant specification.

Claims 1, 19, and 21 are indefinite in the phrase "selected from the group consisting of hydrogen . . . and an alkyl, an aryl, or a cyclo-alkyl group having 1 to 18 carbon atoms" (emphasis added) for improper Markush language. Proper Markush language is "R is selected from the group consisting of . . . and . . ." or "R is . . . or . . ." MPEP 2173.05(h). Applicants are using a combination of both phrases. Thus, it is not clear what is the scope of the instant claim.

Claim 5 is indefinite in the phrase "in the first (bottom) charge transport layers" (emphasis added) for lack of unambiguous antecedent basis in claim 1, from which claim 5 depends. Claim 1 recites "a first (bottom) charge transport layer," not "first (bottom) charge transport layers" as recited in instant claim 5.

Claim 10 is indefinite in the phrase "charge transport components" (emphasis added) for lack of antecedent basis in claim 10. Claim 10 previously recites that the first charge transport layer comprises a solid solution of charge transport compounds molecularly dispersed in a binder" (emphasis added).

It is not clear whether the latter recited "charge transport components" refer only to the formerly recited "charge transport compounds" or to the compounds and other charge transport components.

Claim 18 is indefinite in the phrase "the aryl diamine" for lack of unambiguous antecedent basis in claim 17, from which claim 18 depends. Claim 18 recites an "arylamine," an "aryl diamine" as recited in instant claim 18.

Claim 20 is indefinite in the term "polyvinyl formats" because it is not clear what is meant by the term, which is not defined in the instant specification.

10. Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted element is an electrically conductive substrate or a substrate comprising an electrically conductive layer.

Instant claim 1-9 and 21 recite an imaging member comprising a supporting substrate, an optional electrically conductive layer, a charge generation layer, and a charge transport layer.

Instant claims 10-20 recite an imaging member comprising a supporting substrate, a charge generation layer, and a charge transport layer.

The claims fail to recite that the imaging members have an electrically conductive substrate or a substrate comprising an electrically conductive layer. The specification at page 1, lines 17-23, discloses that an "electrophotographic imaging member device comprising at least one photoconductive insulating layer can imaged [sic] by uniformly depositing an electrostatic charge on the imaging surface of the electrophotographic imaging member and then exposing the imaging member to a pattern to activating electromagnetic radiation, such as, light which selectively dissipates the charge in the illuminated areas of the imaging member while leaving behind electrostatic latent image in the non-illuminated areas." The specification at page 1, lines 28-30, discloses that "[a] number of current imaging members, for example, referred to as multilayered photoreceptors that, in a negative charging system, comprise a supporting substrate, an electrically conductive layer . . ." A conductive support is an essential component of an electrophotographic element to form an "electrostatic latent image." See Diamond, Handbook of Imaging Materials, pp. 395-396. Diamond's Figure 9.7 is a typical dual-layer photoreceptor, which comprises an

electrode layer. It is not clear how imaging members that lack an electrically conductive substrate or a substrate comprising an electrically conductive layer can form an electrostatic latent image. There is no objective evidence on the present record showing that electrostatic latent images can be formed on an imaging member comprising a non-conductive or insulating substrate.

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

12. Claims 1-21 are rejected under 35 U.S.C. 112, first paragraph, as being based on a disclosure which is not enabling. An electrically conductive substrate or a substrate comprising an electrically conductive layer is critical or essential to the practice of the invention. The instant claims do not recite the presence of an electrically conductive substrate or a substrate comprising an electrically conductive layer. Therefore, the instant claims are not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Instant claims 1-21 recite imaging members as described in paragraph 10, supra, which is incorporated herein by reference. The specification does not disclose or teach an imaging member that does not comprise an electrically conductive substrate or a substrate comprising an electrically conductive layer. All the examples in the instant specification comprise a supporting substrate having thereon an electrically conductive layer. For the reasons given in paragraph 10, supra, it is not clear how imaging members that lack an electrically conductive substrate or a substrate comprising an electrically conductive layer can form an electrostatic latent image. There is no objective evidence on the present record showing that electrostatic latent images can be formed on an imaging member comprising a non-conductive or insulating substrate. Thus, all the evidence in the instant specification indicates that an imaging member that does not comprise an electrically conductive substrate or a substrate comprising an electrically conductive layer cannot form an electrostatic latent image. Hence, on the present record, it would require undue experimentation for one of ordinary skill in the art to use an imaging member that does not have an electrically conductive substrate or a substrate comprising an electrically conductive layer to form an electrostatic latent image. The full scope of the instant claimed subject matter

cannot be practiced based on the limited disclosure provided by the instant specification.

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant

is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f), or (g) prior art under 35 U.S.C. 103(a).

16. Claims 10, 12-18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,401,615 (Pai'615).

Pai'615 discloses an electrophotographic imaging member comprising a supporting substrate, an electrically conductive layer, a charge generation layer, a charge transport layer deposited on the charge generation layer, and an overcoat layer deposited on the charge transport layer. Example III at col. 15. The Pai'615 charge transport layer, i.e., the first charge transport layer, comprises 50 wt% of the charge transport compound N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine, based on the total weight of the charge transport layer, dispersed in the binder resin "poly(4,440-isopropylidene-diphenylene carbonate)." Col. 14, line 58, to col. 15, line 2. The amount of 50 wt% was determined from the information provided in Example III of Pai'615. The overcoat layer, i.e., the second charge transport layer, comprises 0.9 grams of N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine and 0.1 gram of t-butylphenylnitrone dispersed in one gram of the polycarbonate resin poly(4,4'-cyclohexylidine-diphenylene

carbonate). See Example III. The transport compound N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine is present in an amount of 45 wt% based on the total weight of the overcoat layer. The amount of 45 wt% was determined from the information provided in Example III. The Pai'615 charge transport layer meets the first charge transport layer limitations recited in instant claims 10, 12-14, 16-18, and 20. The Pai'615 overcoat layer, i.e., the second charge transport layer, meets the second charge transport layer limitations recited in instant claims 10, 12, 13, 15, and 20. The Pai'615 amount of 45 wt% based on the total weight of the overcoat layer is within the amount ranges of "about 25 to about 40 weight percent" and "about 30 to about 40 weight percent," based on the total weight of the layer, recited in instant claims 13 and 15, respectively. The term "about" admits variation. There is no disclosure in the instant specification of critical properties that exclude the Pai'615 amount of 45 weight percent from the upper limit amount, "about 40 weight percent," in the amount ranges recited in instant claims 13 and 15. Thus, the Pai'615 amount of 45 weight percent of the charge transport compound in the Pai'615 overcoat layer is within the ranges recited in instant claims 13 and 15.

17. Claims 1-6, 8, 10, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pai'615 combined with US 6,338,927 B1 (Inagaki).

Pai'615 discloses an electrophotographic imaging member as described in paragraph 16 above, which is incorporated herein by reference.

For the reasons discussed in paragraph 16 above, the Pai'615 charge transport layer meets the first charge transport layer limitations recited in instant claim 10. The Pai'615 charge transport layer also meets the first charge transport layer limitations recited in instant claims 1, 4-6, 8, and 21. For the reasons discussed in paragraph 16 above, the Pai'615 overcoat layer meets the second charge transport layer limitations recited in instant claims 1-3, 8, 10, 19, and 21, but for the presence of the particular stilbene compound of Formula (II) recited in instant claims 1, 19, and 21.

Pai'615 does not exemplify an overcoat layer, i.e., second charge transport layer, comprising the hole transporting compound of Formula (II) recited in instant claims 1, 19 and 21. However, Pai'615 does not limit the type of charge transport compound used in its overcoat layer. Pai'615 teaches that the charge transport small molecule in the overcoat layer "can be any one of the

aforementioned monomers employed to fabricate the transport layer." Col. 10, lines 33-37. Pai'615 teaches that "any suitable charge transporting . . . small molecule may be employed in the charge transport layer of this invention . . . [t]ypical charge transporting small molecules include, for example, . . . diamines . . . stilbenes. Col. 8, lines 51-58, 60, and 66.

Inagaki teaches a charge transferring diamine stilbene compound comprising two triphenylamino groups, located at both sides of a benzene ring in a molecular center, which are unsymmetrical with respect to the benzene ring. Col. 2, lines 3-7 and 25-28; and formula (1) at col. 2, lines 29-61. The Inagaki diamine stilbene compounds I-20 and I-21 of formula (9) are within the limitations of Formula (II) recited in instant claims 1, 19, and 21. Col. 11, formula (9); col. 11, line 44, to col. 12, line 49; and Table 1 at col. 13, compounds I-20 and I-21. Compounds I-20 and I-21 comprise two -CH=CH- groups, where one of the groups is ortho (i.e., 2)- substituted on the phenyl group bonded to the nitrogen atom in one the triphenylamino groups, and the other -CH=CH- group is para (i.e., 4)-substituted on the phenyl group bonded to the nitrogen atom in the second triphenylamino group. According to Inagaki, compounds I-20 and I-21 are "superior in compatibility with a binder resin to a conventional stilbene derivative" and have "a

large charge mobility." Col. 2, lines 18-20. An electrophotographic member comprising said compounds has "improved sensitivity and repeatability as compared with a conventional electrophotosensitive material." Col. 2, lines 8-11. Inagaki further teaches that its charge transferring diamine stilbene compounds can be used in the charge transport layers of multi-layered electrophotosensitive materials. Col. 31, lines 36-48. Inagaki discloses that regarding the multi-layered member, "the residual potential of the member is drastically lowered and the sensitivity is improved as compared with an electrophotosensitive material using a conventional stilbene derivative as the hole transferring material." Col. 31, lines 49-54.

It would have been obvious to a person having ordinary skill in the art, in view of the teachings of Pai'615 and Inagaki, to use the Inagaki compounds I-20 or I-21 as the charge transporting compound in the overcoat layer in the imaging member disclosed in example III of Pai'615, because that person would have had a reasonable expectation of successfully obtaining an electrophotographic imaging member that has improved sensitivity and repeatability.

18. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pai'615 combined with Inagaki, as applied to claim 1 above, further combined with US 4,265,990 (Stolka).

Pai'615 combined with Inagaki renders obvious an electrophotographic imaging member as described in paragraph 17 above, which is incorporated herein by reference.

According to Pai'615, its imaging member is "capable of reproducing extremely high resolution images." The imaging member has a "surface region stable against loss of resolution" and "stable against copy defects such as print deletion. Col. 5, lines 52-63. Pai'615 further discloses that its imaging member has "greater stability against corona effluents without an attendant reduction in transport efficiency of transport layers." Col. 5, lines 64-68.

Pai'615 does not exemplify a charge transport layer i.e., first charge transport layer, that comprises the charge transporting compound N,N'-diphenyl-N,N'-bis(4-methylphenyl)-1,1'-biphenyl-4,4'-diamine as recited in instant claim 7. However, Pai'615 teaches that "any suitable charge transporting . . . small molecule may be employed in the charge transport layer of this invention . . . [t]ypical charge transporting small molecules include, for example, . . . diamines. Col. 8, lines 51-60.

Stolka teaches the charge transport compound N,N'-diphenyl-N,N'-bis(4-methylphenyl)-1,1'-biphenyl-4,4'-diamine as recited in instant claim 7. Examples V and VI at cols. 14-15. Stolka teaches that said compound is equivalent to N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine as a charge transport compound. Col. 3, lines 1-17; and Examples I and III at cols. 12-14. Stolka discloses that when a layer comprises either charge transport compound dispersed in a polycarbonate binder, "the layer transports charge very efficiently without any trapping of charges when subjected to charge/light discharge cycles in an electrophotographic mode. There is no buildup of the residual potential over many thousands of cycles." Col. 7, lines 28-34.

It would have been obvious to a person having ordinary skill in the art, in view of the teachings of Stolka, to use the equivalent N,N'-diphenyl-N,N'-bis(4-methylphenyl)-1,1'-biphenyl-4,4'-diamine as the charge transport compound in the charge transport layer in the imaging member rendered obvious over the combined teachings of Pai'615 and Inagaki, because that person would have had a reasonable expectation of successfully obtaining an electrophotographic imaging member having benefits disclosed by Pai'615 and Stolka, as discussed above.

19. Claims 10, 11, 13-15, 17, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by US 2002/0106570 A1 (Kami).

Kami discloses an electrophotographic imaging member comprising an electrically conductive support, a charge generation layer, a first charge transport layer deposited on the charge generation layer, and a second charge transport layer deposited on the first charge transport layer. Example 20 in paragraphs 0503 to 0504. The first charge transport layer comprises a stilbene charge transport compound comprising a triphenylamino group and the "Bisphenol Z-type polycarbonate resin" as the binder resin. The stilbene charge transport compound is present in an amount of 50 wt% based on the total weight of the charge transport layer. The stilbene compound disclosed by Kami is within the scope of the "arylamine" charge transport compound recited in instant claim 17. The second charge transport layer comprises the stilbene charge transport compound used in the first charge transport layer, the "Bisphenol Z-type polycarbonate resin" as the binder resin, and the filler α-alumina. The stilbene charge transport compound is present in an amount of 33 wt% based on the total weight of the second charge transport layer. The amounts of the 50 wt% and 33 wt% were determined from the information provided in Example 20 of Kami. The Kami first charge transport layer meets the first

charge transport layer limitations recited in instant claims 10, 11, 13, 14, 17, and 20. The Kami second charge transport layer meets the second charge transport layer limitations recited in instant claims 10, 11, 13, 15, and 20.

20. Claims 1-4, 8, 9, 10, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kami, as evidenced by Pai'615, combined with Inagaki.

Kami discloses an electrophotographic imaging member as described in paragraph 19 above, which is incorporated herein by reference.

For the reasons discussed in paragraph 19 above, the Kami first charge transport layer meets the first charge transport layer limitations recited in instant claim 10. The Kami first charge transport layer also meets the first charge transport layer limitations recited in instant claims 1, 4, 9, and 21. For the reasons discussed in paragraph 19 above, the Kami second charge transport layer meets the second charge transport layer limitations recited in instant claims 1-3, 9, 10, 19, and 21, but for the presence of the particular stilbene compound of Formula (II) recited in instant claims 1, 19, and 21. The "Bisphenol A Z-type polycarbonate resin" in the charge transport layers of Kami is defined in the art as a poly(4,4'diphenyl)-

1,1'-cyclohexane carbonate, which meets the binder resin limitation recited in instant claim 8. See Pai'615 at col. 10, lines 9-15.

Kami does not exemplify a second charge transport layer comprising the charge transporting compound of Formula (II) recited in instant claims 1, 19 and 21. However, Kami does not limit the type of charge transport compound used in its second charge transport layers. Kami teaches that the charge transport compound can be a low molecular weight charge transporting materials, including positive hole transporting materials, such as triphenylamine derivatives. Paragraphs 0128-0129; paragraph 0130, line 4; and paragraph 0177. Kami prefers that the second charge transport layer shows "a high charge mobility and that the charge mobility be high even in a low electric field for reasons of high sensitivity for reasons of high responsibility." Paragraph 0179, lines 1-4.

Inagaki teaches a charge transferring diamine stilbene compound comprising two triphenylamino groups located at both sides of a benzene ring in a molecular center which are unsymmetrical with respect to the benzene ring. The Inagaki diamine stilbene compounds I-20 and I-21 of formula (9) are within the limitations of Formula (II) recited in instant claims 1, 19, and 21. The discussion of Inagaki in paragraph 17

above is incorporated herein by reference. As discussed in paragraph 17 above, according to Inagaki, compounds I-20 and I-21 have "a large charge mobility" and that an electrophotographic member comprising said compounds has "improved sensitivity and repeatability as compared with a conventional electrophotosensitive material." The "large charge mobility" and "high sensitivity" are the objectives sought by Kami.

It would have been obvious to a person having ordinary skill in the art, in view of the teachings of Kami and Inagaki, to use the Inagaki compounds I-20 or I-21 as the charge transporting compound in the second charge transport layer in the imaging member disclosed in example 20 of Kami, because that person would have had a reasonable expectation of successfully obtaining an electrophotographic imaging member that has improved sensitivity and repeatability.

21. Claims 10, 11, 13-18, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by US 2004/0126685 (Horgan). The disclosure relied on in Horgan in the rejection has an effective filing date of Dec. 16, 2002, as evidenced by the provisional application 60/433,887 (Application'887), which Horgan claims priority to. The filing date of Dec. 16, 2002, is prior to the filing date of the subject matter recited in instant

claims 10, 11, 13-18, and 20. See the discussion in paragraph 4, supra.

Horgan discloses an electrophotographic imaging member comprising a supporting substrate, an electrically conductive layer, a charge generation layer, a first charge transport layer deposited on the charge generation layer, and a second charge transport layer deposited on the first charge transport layer. Horgan, example IV at page 12, paragraph 0120; and Application'887, example IV at page 22. The Horgan first charge transport layer comprises 50 wt% of the charge transport compound N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine, based on the total weight of the charge transport layer, dispersed in the polycarbonate binder resin MAKROLON. The second charge transport layer comprises 35 wt% of N,N'-diphenyl-,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine dispersed in the polycarbonate binder resin MAKROLON. MAKROLON is identified as a polycarbonate resin. Horgan, paragraph 0109; and Application'887, page 19, lines 14-16. The Horgan charge transport layer meets the first charge transport layer limitations recited in instant claims 10, 11, 13, 14, 16-18, and 20. The Horgan second charge transport layer meets the second charge transport layer limitations recited in instant claims 10, 11, 13, 15, and 20.

22. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

23. Claims 10, 11, 13-18, and 20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 6,780,554 B2 (Tong).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in Tong render obvious the subject matter recited in the instant claims.

Reference claim 8, which depends from reference claim 1, recites an imaging member comprising a photogenerating layer, i.e., a charge generation layer, a first charge transport layer deposited on the photogenerating layer, and a second charge

transport layer deposited on the first charge transport layer. The first charge transport layer comprises about 40 wt% of N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine and about 60 wt% of poly(4,4'-diphenyl-1,1'-cyclohexane carbonate), which meets the first charge transport layer limitations recited in instant claims 10, 11, 13, 14, 16-18, and 20. The amount of about 40 wt% is within the amount ranges of "about 50 to about 90 weight percent" and "about 50 to about 70 weight percent," based on the total weight of the layer, recited in instant claims 13 and 14, respectively. The term "about" admits variation. There is no disclosure in the instant specification of critical properties that exclude the Tong amount of 40 wt% from the lower limit amount, "about 50 weight percent," in the amount ranges recited in instant claims 13 and 14. Thus, the amount of 40 wt% of the charge transport compound in the first charge transport layer recited in reference claim 8 is within the ranges recited in instant claims 13 and 14. Reference claim 9, which depends from reference claim 1, recites that the second charge transport layer comprises about 35 wt% of N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine, about 35 wt% of poly(4,4'-diphenyl-1,1'-cyclohexane carbonate), and about 30 wt% of a second binder resin. The second charge transport layer meets the second charge transport layer limitations recited in

instant claims 10, 11, 13, 15, and 20. Reference claim 21, which depends from reference claim 1, further requires that the imaging member comprise a supporting substrate.

It would have been obvious for a person having ordinary skill in the art, in view of the subject matter in the claims of Tong, to use the second charge transport layer recited in reference claim 9 as the second charge transport layer in the imaging member recited reference claim 8, and to incorporate the supporting substrate recited in reference claim 21 in the resulting imaging member, because that person would have had a reasonable expectation of successfully obtaining an imaging member comprising a supporting substrate that is capable of being used in an image forming method.

24. Claims 10, 11, 13-18 and 20 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 21-31 of copending Application No. 10/737,545 (Application'545).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in Application'545 render obvious the subject matter recited in the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Reference claim 24, which depends from reference claim 21, recites an imaging member comprising a supporting substrate, a charge generating layer, a first charge transport layer deposited on the charge generating layer, and a second charge transport layer deposited on the first charge transport layer, where the charge transport compounds in each layer is molecularly dispersed in a film forming polymer binder. The charge transport compound in the first charge transport layer can be N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine, which meets the charge transport compound limitations recited in instant claims 16-18. The second charge transport layer comprises between about 25 wt% to about 40 wt%, based on the total weight of the layer, of the terphenyl charge transport compound, which meets the amounts of the charge transport compound in the second charge transport layer recited in instant claims 1 and 13, and overlaps the amount of about 30 to about 40 wt% recited in instant claim 15. The film forming polymer binder can be a polyester, polyvinyl butyral, polycarbonate, or polystyrene as recited in instant claim 20. Reference claim 25, which depends on reference claim 21, requires that the first charge transport

layer comprise from about 50 wt% to about 70 wt%, based on the total weight of the layer, of the charge transport compound, which meets the amounts of the charge transport compound in the first charge transport layer recited in instant claims 1, 13, and 14. Reference claim 30 which depends on reference claim 21, requires that both charge transport layers comprise a solid solution of the charge transport compounds and film forming binder.

It would have been obvious for a person having ordinary skill in the art, in view of the subject matter in the claims in Application'545, to use make and use an imaging member as recited in the instant claims, because that person would have had a reasonable expectation of successfully obtaining an imaging member that is capable of being used in an image forming method.

25. Claims 10-18 and 20 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-42 of copending Application No. 10/736,864 (Application'864).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in Application'864 render obvious the subject matter recited in the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Reference claim 15, which depends from reference claim 13, which in turn depends from reference claim 1, recites an imaging member comprising a supporting substrate, a charge generating layer, a first charge transport layer deposited on the charge generating layer, and a second charge transport layer deposited on the first charge transport layer. The first charge transport layer comprises a film forming polymer binder and from about 40 wt% to about 80 wt%, based on the total weight of the layer, of a charge transport compound, which meets the amount of the charge transport compound in the first charge transport layer recited in instant claim 10, and overlaps the amount ranges recited in instant claims 13 and 14. The second charge transport layer comprises a film forming polymer resin and from about 30 wt% to about 40 wt%, based on the total weight of the layer, of a charge transport compound, which meets the amounts of the charge transport compound in the second charge transport layer recited in instant claims 1, 13 and 15. Reference claim 14, which depends from reference claim 13, requires that the charge transport compound in the first charge transport layer be present in an amount from about 50 to about 70 wt%, based on the total

weight of the layer, which meets the amounts of the charge transport compound in the first charge transport layer recited in instant claims 13 and 14. Reference claim 11, which depends on reference claim 1, recites that the charge transport compound in the charge transport layers is dissolved in the film forming polymer to form a solid solution. Reference claim 4, which depends on reference claim 1, requires that the film forming polymer binder in both charge transport layers to be the same, which meets the binder resin limitation recited in instant claim 11. Reference claim 5, which depends on reference claim 1, requires that the film forming polymer binder in both charge transport layers to be different, which meets the binder resin limitation recited in instant claim 12. Reference claim 18, which depends from reference claim 1, recites that the charge transport compound in each of the two layers can be N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine, which meets the charge transport compound in the first charge transport layer limitations recited in instant claims 16-18. Reference claim 23, which depends from reference claim 1, recites that the binder can be a polyester, polyvinyl butyral, polycarbonate, polystyrene or "polyvinyl formats," as recited in instant claim 20.

It would have been obvious for a person having ordinary skill in the art, in view of the subject matter in the claims in Application'864, to use make and use an imaging member as recited in the instant claims, because that person would have had a reasonable expectation of successfully obtaining an imaging member that is capable of being used in an image forming method.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The central fax phone number is (703) 872-9306.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLD
Dec. 4, 2004

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